# Chapter Five: Amtrak *Cascades* Needed Infrastructure Improvements

In 1993, the Washington State Legislature directed the Washington State Department of Transportation (WSDOT) to develop high-quality intercity passenger rail service through the incremental upgrading of the existing BNSF Railway Company's (BNSF) north-south main line. Since that time, WSDOT has been working with the BNSF and other organizations to develop operating plans and identify/prioritize infrastructure projects. These projects would improve existing service and enable WSDOT to fulfill the legislature's directive to provide safe, faster, more frequent, and reliable passenger rail service through an incremental approach.

This chapter discusses these major infrastructure improvements and their relationship to the service goals presented in Chapter Three of this document. The infrastructure improvements, which are presented in this chapter, reflect the best solution at this time. Other solutions that meet the same operational needs may emerge as each project is fully investigated through the environmental process.

## How were these improvements identified?

Railroad companies perform careful operations studies to determine the need, type, and location for additional tracks. Public agencies sponsoring passenger rail service also study the need for additional tracks and facilities. Often the public agency—and the railroad owning the rail line—will study track needs repeatedly, removing and adding tracks, until both parties agree on the amount of track and other improvements absolutely necessary to perform the desired function and achieve the operational goals. WSDOT, working with the BNSF, performed many such studies.[1] These studies began in the early 1990s and have continued throughout project planning. Other agencies involved in this planning include Amtrak, the Union Pacific Railroad, and the Ports of Seattle and Tacoma. As recently as 2002, these agencies, together with WSDOT, participated in rail modeling activities at BNSF headquarters in Fort Worth, TX.

These modeling efforts looked at the rail corridor over a fifty year horizon. The modeling incorporated all freight and passenger needs of the many

[1] *The operations studies were preceded by a detailed economic and ridership analysis that established the travel time and train frequency (service) goals that would provide the best cost-benefit relationship.*

corridor users. Modeling and planning for freight and passenger rail along the PNWRC was not done in isolation, but in cooperation with the major stakeholders and customers of the rail line.

These studies follow the location of current and future passenger and freight trains minute-by-minute along a specific segment of a rail line. As part of each analysis, a number of steps are performed:

- Representation of the existing track configuration.
- Identification of the minute-by-minute location of every train entering and leaving the area (current trains as well as anticipated future trains).
- Determination of the conflicts between trains as they use the tracks and associated facilities.
- Determination of what conflicts could be solved by changing the time certain trains operate, as well as determining if the time can be changed for these trains (trains have various schedule and maintenance requirements that need to be met).
- Determination of what additional track and facilities are required to accommodate trains that cannot operate at different times. When considering additional track, the possible environmental and economic consequences are also considered.
- Determination of the track and other facilities needed specifically to achieve the service goals.

This procedure was repeated over the course of many years to ensure that each proposed infrastructure improvement fulfills WSDOT's goals of providing safe, more frequent, faster, and reliable passenger rail service between Vancouver, BC and Portland, OR without degrading freight rail service.

### How does the physical characteristic of the track relate to rail operations?

Upgrading tracks and facilities is critical when planning an intercity passenger rail system on an existing freight corridor. In order to eliminate conflicts between freight and passenger rail, and to ensure that the ability to conduct current and future freight operations is not diminished, operations analysis is used to identify the types and locations of improvements that are necessary to maintain the rail line's capacity for freight service.

During the operations analysis, passenger trains are incrementally added to the tracks to see if there is enough rail capacity to handle the additional traffic at a given time. If there is a conflict with an existing (or future) freight train, a simple solution may be to change the passenger train's schedule. This may solve the problem. However, during the analysis, consideration also has to be given to the potential loss (or gain) in ridership that may result from a schedule change. Because of this, operations analyses are often done in conjunction with ridership and commercial viability studies. Another solution to fitting more trains on a track is to see where the conflicts or chokepoints occur on the rail line, and then identify a physical solution that could solve the conflict. However, this approach to operations analysis isn't simple either.

A railroad is a fixed-guideway transportation system. Trains, unlike motor vehicles, must follow a track. Trains can only change "lanes," turn, or enter/leave the route when a track has been specifically constructed for that purpose. Designing for railroads involves figuring out exactly where trains will need to enter and leave the main line, change tracks, and turn onto another route. As such, a number of rail characteristics must be taken into consideration. **Exhibit 5-1** on the following page highlights some of these general railroad elements.

Each of the proposed infrastructure improvements presented in this chapter was designed by figuring out how specific tracks at specific locations could solve the problems in that location, as identified as part of the rail operations analysis.

## What were the results of these analyses?

The operations analysis identified needed projects along the main line between Vancouver, BC and Portland, OR. Each project was developed to solve a particular problem or eliminate a chokepoint within the system. Every one of these projects was designed with the purpose to fulfill a specific service need. Because the operations analysis is based on an incremental approach, each of these projects independently fulfills a specific service (operational) goal. The incremental implementation plan was designed to ensure that if funding is not available to complete all of the needed projects along the corridor, the state's investment would not be wasted. Projects were designed to maximize system operations – one project at a time. This approach also requires that projects be built in a very specific order in order to ensure that not only the individual problem is solved (by each individual project) but when put together, a larger, operational problem is solved – thus contributing to the ability to increase service. If projects are not constructed in order (as identified in this plan), project completion cannot be followed immediately by service increases.[2]

[2] *However, benefits will still be derived from each individual project as it relates to its specific location and problem.*

**Exhibit 5-1**
**Railroad Characteristics and Their Relevance**

| Characteristic | Why is it important? |
|---|---|
| Track Structure | Track structure has three elements: rails, ties, and ballast. **Rails** are made of steel. Even though the steel is very hard, the rail wears out, just as highway pavement wears out. The **ties**, typically made of wood or concrete, support the rails. **Ballast** is crushed rock used to support the ties and keep the track in correct alignment. The condition of each of these elements dictates the weight and type of equipment that can be used on the track, as well as the speeds allowed on the track. |
| Number of Tracks and Sidings | The number of tracks affects the capacity of the line. Two tracks (also called **double track**) have more capacity (the number of trains that can move through the area) than one track (**single track**). **Sidings** also increase the capacity of a rail line. Sidings located along the line allow faster trains to overtake slower trains without affecting train traffic on the other track. On a single track line, sidings are also needed to allow one of two trains moving in opposite directions to clear the way for the other. The capacity of the rail line and the reliability of operation are affected by the time required to move between sidings. |
| Grade (the steepness of the tracks) | The steepness of the track dictates the types of trains that can use the rail line. Typical grades for freight trains do not exceed two percent, while grades for passenger trains can be as high as four percent. |
| Curves (often presented in degrees) | The tightness of the **curve** dictates the speed that a train can travel. The higher the degree, the tighter the curve, the slower the speed. Amtrak *Cascades* trains can travel faster through tight curves (than most trains) because they use tilt technology. |
| Speed Regulations | Train **speed limits** are generally regulated by the Federal Railroad Administration (FRA). The Code of Federal Regulations (49 CFR 213, Track Safety Standards) establishes classes of track with associated speed limits and detailed physical requirements for tracks in a given class. Speeds may also be restricted by the Washington Utilities and Transportation Commission (WUTC) if a unique local safety condition exists. |
| Capacity | The number of trains moving at normal speed that the rail line is capable of accommodating. Capacity and reliability are related. When traffic exceeds capacity, delays increase and train service is not reliable. |
| Flexibility | The ability of trains to move among tracks, or “change lanes” to pass other trains or to pass maintenance work on one of the tracks. Flexibility allows maximized use of the tracks and limits the requirement for additional track. |
| Reliability | The ability to operate trains that consistently adhere to schedule. |
| Traffic (Number of Trains) | The **number and type of trains** along a rail line relate directly to capacity. The more trains that are put on a track, the more capacity is required, generally in the form of increased speed, additional track signals and improved traffic control. Without additional capacity, the speed and traffic on the rail line would diminish as traffic increases. |

**Exhibit 5-1 (Continued)**
**Railroad Characteristics and Their Relevance**

| Characteristic | Why is it important? |
|---|---|
| Width | The rails of a railroad track are spaced 56.5 inches apart. To allow sufficient clearance between vehicles on adjacent tracks, the tracks are generally spaced at least fifteen feet apart. This is often referred to as 15-foot track centers. |
| Length | Each track that is not a through-route must be long enough to serve the intended purpose. Just as a parking space for a tractor-trailer must be of sufficient length for the vehicle, a railroad track must be long enough to hold even the longest train. The required length depends upon the type of train traffic handled. The length of a typical passenger train is between 500 feet and 1,700 feet. The length of a typical freight train can be between 7,000 feet and 10,000 feet (over a mile—5,280 feet—in length). |
| Signals and Traffic Control | **Signals** help extend the engineer's sight distance and therefore allow greater speeds. **Traffic control** determines which trains can use which tracks. The type of traffic control system is related to capacity because it affects the ability to utilize the main line tracks. |

## What are the current conditions along the rail line?

Amtrak *Cascades* service operates along the Pacific Northwest Rail Corridor (PNWRC). This corridor extends from Vancouver, BC to Portland, OR along the BNSF north-south main line.[3]

The BNSF's predecessors -- the Great Northern Railway and the Northern Pacific Railroad -- originally constructed what now has become the Pacific Northwest Rail Corridor, and several other different routes. The oldest part of the line was constructed in 1872, the newest in 1914. In the intervening years, many sections of the rail line were constructed, including some that replaced part of the original construction in order to improve the route. Generally the sections of line that were relocated had relatively steep grades, which were a more important consideration in that era than now because the largest locomotives were much less powerful than a typical locomotive today. Improvements since 1914 have generally consisted only of improved signal and traffic control systems, and tracks leading into or supporting industrial zones that have been built since 1914.

[3] *There are three short exceptions to BNSF ownership of the route. Pacific Central Station in Vancouver, BC is owned by VIA Rail Canada. The Fraser River Bridge is owned by the government of Canada and operated by the Canadian National Railway. The rail line which serves Portland's Union Station, is owned by the Portland Terminal Railroad which is owned jointly by the Union Pacific Railroad and the BNSF. For the most part, BNSF controls rail operation on this rail corridor.*

In addition to the BNSF's rail traffic, the rail line between Portland, OR and Vancouver, BC also has several tenants. In British Columbia:

- Canadian National Railroad between Townsend and Vancouver Junction;
- VIA Rail Canada and Rocky Mountain Railtour's passenger trains between Fraser River Junction and Pacific Central Station;
- West Coast Express between CP Junction and Vancouver Junction;
- Canadian Pacific Railroad between Townsend and CP Junction;
- Canadian National Railroad and Canadian Pacific Railroad at Colebrook;

In Washington and Oregon:

- Sound Transit between Reservation (Tacoma) and Everett;
- Union Pacific between Portland, OR and Seattle; and
- Amtrak (including the *Cascades*) between Portland, OR and Vancouver, BC.

The BNSF has recently sold their line between Tacoma and Nisqually via Lakewood to Sound Transit. This is the line known in this document as the Point Defiance Bypass. The BNSF, Tacoma Rail, and Amtrak (including the Amtrak *Cascades*), will be tenants on this line.

Because of this large number of tenants, as freight and passenger rail traffic grows, capacity will begin to be filled. New main lines and sidings will be required. The current rail line consists of two tracks between Portland, OR and Seattle except for a one and one half mile single track section between the Nelson Bennett Tunnel and Ruston, south of Tacoma. Between Seattle and Everett the line alternates between single track and two tracks. North of Everett is single track.

The operations analysis used this information as a basis for developing the future Amtrak *Cascades* service plan. More information about the passenger rail operations, methodology, assumptions, and results can be found in the *Amtrak Cascades Operating and Infrastructure Plan Technical Report*, 2004.

## What are the identified infrastructure improvements?

Project improvements are located throughout Washington State's segment of the corridor, as well as in British Columbia and Oregon.[4] The following

[4] *WSDOT identified these potential improvements through their continuous evaluation of the existing rail corridor and the ongoing operational analysis for the Amtrak Cascades*

discussion focuses on those projects located in the state of Washington. They are presented geographically, from north to south. The projects have been identified by their rail milepost. Mileposts are designations by the railroad indicating the distance from an established starting point. As part of this discussion, a general description of each project is presented, why it is needed, and how it can independently solve a particular problem.[5] The estimated capital cost of constructing each project is also presented. These cost estimates were developed using 2006 dollars. Actual costs will vary, depending on the availability of funding, the outcome of environmental analysis conducted for each project, and the year when projects are finally constructed.

## What projects are needed in Whatcom and Skagit Counties?

Seven projects have been identified for this part of the Pacific Northwest Rail Corridor. **Exhibit 5-2,** on the following page, presents their general location.

### Swift Customs Facility (rail milepost 114.6 to 118.3)

Congestion on the tracks south of Blaine, near the U.S. Customs and Border Protection facility, can cause delays for Amtrak *Cascades* passenger trains traveling between Seattle and Vancouver, BC.

The siding and associated tracks will allow freight train inspections to occur off the main line, helping to ensure that passenger trains operate on time. Siding is track located next to a main line that allows a train to move out of the way of an oncoming train. Sidings are also used to store trains or to add/subtract rail cars. The estimated construction cost for this project is $13.8 million. This project is listed in the "2005 Transportation Partnership Account," but will require additional funding beyond the $3 million allocated by the state legislature. The project also has an additional $3 million in federal funding.

### Bellingham to Blaine High-Speed Track (rail milepost 101.5 to 117.1)

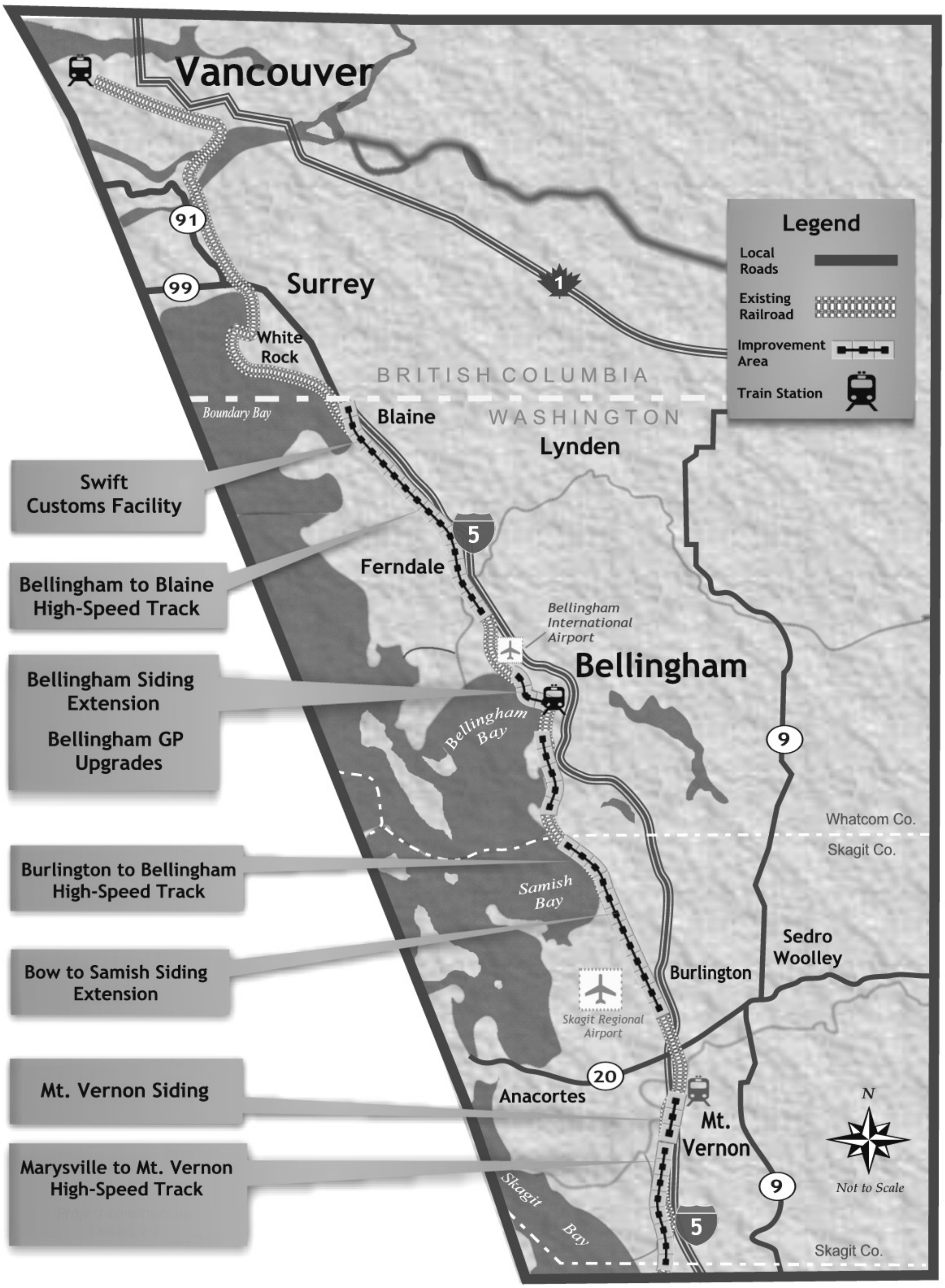
This project entails construction of a high-speed track and associated facilities. The purpose of the project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Vancouver, BC to achieve WSDOT's service goal. This project is needed because the current physical condition of the track and the current track

---

*program. The state of Oregon and the province of British Columbia did not participate in the development of these projects. WSDOT recognizes that it will be each of these jurisdictions's responsibility to review WSDOT's findings and perform their own research to solve the given problems along the rail line in Oregon and British Columbia.*

[5] *Once all of these projects are constructed, the Amtrak Cascades service goals for year 2023 could be achieved. WSDOT would fulfill its directive to provide safe, reliable, faster and more frequent passenger rail service.*

**Exhibit 5-2**
**Whatcom and Skagit Counties Project Improvements**



geometry in this location (due to the terrain) does not allow trains to travel at high speeds. The estimated construction cost of this project is $147.8 million.

### Bellingham Siding Extension (rail milepost 92.2 to 97.9)

The purpose of this project is to allow passenger and freight trains to pass each other. The current siding at this location is not long enough to accommodate most freight trains. If this siding were not extended and two trains were traveling towards this location on the same track, one of them would have to wait at the first available siding (Bow or Ferndale if those sidings are not occupied by another train) to ensure that the other train could pass. Depending on the location of the nearest available siding, a train could feasibly wait as long as eighty minutes until the oncoming train passes. By having a siding at this location, it shortens the length (and therefore time) between sidings. This project increases capacity and reliability. The estimated construction cost of this project is $102.6 million.

### Bellingham GP Upgrade (rail milepost 96 to 97)

The existing main line located at the Georgia Pacific plant in Bellingham will be rehabilitated. The purpose of this rehabilitation is to improve the track so that it can handle higher speeds. This improvement is needed because the current condition of the existing track does not meet Federal Railroad Administration (FRA) standards for increased speeds. This project will result in increased passenger and freight rail speeds, which will improve service and increase capacity and reliability. The estimated construction cost of this project is $2.3 million. This project is listed in the “2003 Legislative Funding Package,” but will require additional funding beyond the $200,000 allocated by the state legislature.

### Burlington to Bellingham High-Speed Track (rail milepost 72.2 to 86.5)

This project entails construction of fourteen miles of high-speed track and associated facilities. The purpose of the project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Vancouver, BC to achieve WSDOT’s service goal. This project is needed because the current physical condition of the track and the current track geometry in this location (due to the terrain) does not allow trains to travel at high speeds. The estimated construction cost of this project is $408.5 million.

### Bow to Samish Siding Extension (rail milepost 81 to 83.5)

The purpose of this project is to allow passenger and freight trains to pass each other. The current siding at Samish is not long enough to accommodate most freight trains. If this siding were not extended and two trains were traveling towards this location on the same track, one of them would have to wait at the first available siding (existing Bow or Ferndale if not occupied by another train) to ensure that the other train could pass.

Depending on the location of the nearest available siding, a train could feasibly wait as long as eighty minutes until the oncoming train passes them. By having a siding at this location, it shortens the length (and therefore time) between sidings. This project increases capacity and reliability. The estimated construction cost of this project is $50.6 million.

### Mount Vernon Siding (rail milepost 65.5 to 67.5)

Currently southbound morning trains leaving Bellingham must wait for the northbound trains to pass them before they can begin their run. The siding upgrades will allow those trains to pass each other in Mount Vernon, eliminating the southbound train's wait time in Bellingham.

This upgrade will allow an earlier departure from Bellingham and better Portland connections in Seattle. Because of this change in schedule, the trainset will be available to accommodate an additional Amtrak *Cascades* roundtrip between Seattle and Portland, OR in mid-2006.

More refined cost estimates will be negotiated with BNSF before construction is initiated. The estimated construction cost of this project is $8.4 million. This project is listed in the "2003 Legislative Transportation Package," but may require additional funds beyond the $3.8 million allocated by the state Legislature.

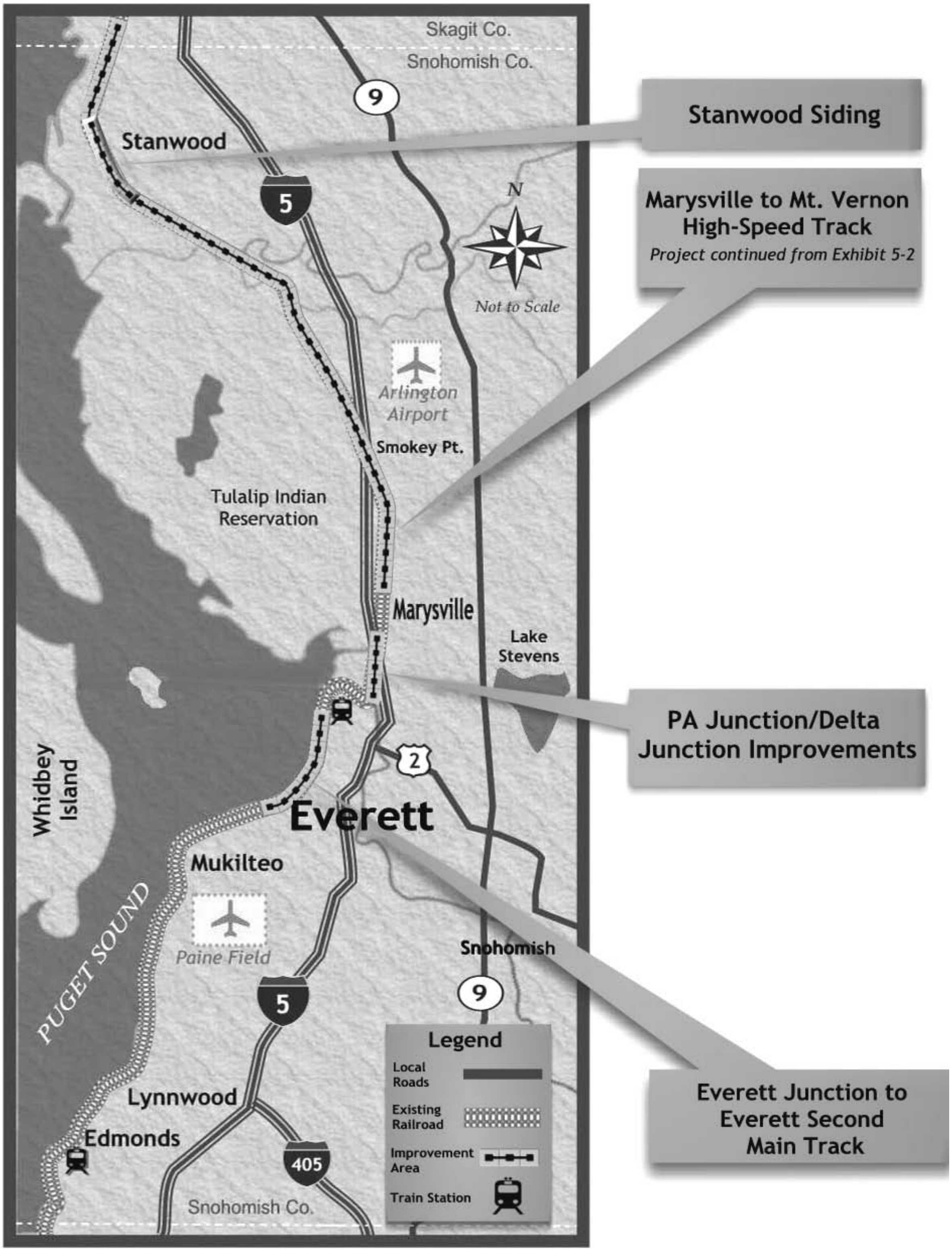
### Marysville to Mount Vernon High-Speed Track (rail milepost 39.19 to 67.5)

This project entails construction of twenty-eight miles of high-speed track and associated facilities. The purpose of the project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Vancouver, BC to achieve WSDOT's service goal. This project is needed because the current physical condition of the track and the current track geometry in this location (due to the terrain) does not allow trains to travel at high speeds. The estimated construction cost of this project is $322.5 million.

## What projects are needed in Snohomish County?

Four projects have been identified for this part of the Pacific Northwest Rail Corridor. In addition, a number of other projects, which will be implemented by Sound Transit, will also be required to fulfill the Amtrak *Cascades* service goals. One of these projects, the Marysville to Mount Vernon High-Speed Track is also located in Skagit County and was previously discussed. **Exhibit 5-3** presents the general location of the other projects in Snohomish County.

**Exhibit 5-3**
**Snohomish County Project Improvements**



### Stanwood Siding (rail milepost 55.18 to 57.93)

The purpose of this project is to allow passenger and freight trains to pass each other. The current siding at this location is not long enough to accommodate most freight trains. If this siding were not extended, and if two trains were traveling towards this location on the same track, one of them would have to wait at the first available siding (English and Bow if not occupied by another train) to ensure that the other train could pass. Depending on the location of the nearest available siding, a train could feasibly wait as long as seventy minutes until the oncoming train passes them. By having a siding at this location, it shortens the length (and therefore time) between sidings. This project will increase capacity and reliability. The estimated construction cost of this project is $9.9 million. This project is listed in the “2003 Legislative Transportation Package,” but will require additional funding beyond the $3 million allocated by the state legislature.

### PA Junction/Delta Junction Improvements (rail milepost 10.9 to 7.8)

Yard tracks must be constructed to mitigate the use of the main track by passenger trains. After the discontinuance of the previous Amtrak service, increasing freight traffic made it necessary for BN to begin using the main track for additional yard capacity. The return of passenger trains has limited the ability to use the main track for freight trains; a situation has been a source of congestion and delay. This project allows for the continued operation of the Seattle to Bellingham train. More refined cost estimates will be negotiated with BNSF before construction is initiated. In addition, the current track condition and geometry in this area restricts Amtrak *Cascades* trains to a speed of 10 to 43 mph and freight trains to a speed of 10 to 15 mph. The project will improve the main track, and in some places, construct new track to allow Amtrak *Cascades*’ speeds of 35 to 50 mph and freight train speeds of 30 to 35 mph. The project will also provide a new siding to allow overtaking and opposing trains to pass. These improvements will increase capacity and reliability and reduce the running time of the Amtrak *Cascades* trains. The estimated construction cost of this project is $34.4 million. This project is listed in the “2003 Legislative Transportation Package,” but will require additional funding beyond the $14 million allocated by the state legislature.

### Everett Junction to Everett Second Main Track (rail milepost 1783.6[6] to 32)

A one-mile extension of a second main track in this location will reduce the length of single track operations. This will result in smoother passenger and

[6] *This rail milepost number remains from the Great Northern Railway’s network. The number represents the distance to St. Paul, Minnesota.*

freight train operations, increased reliability, and increased capacity. The estimated construction cost of this project is $9.9 million.

## What projects are needed in King County?

Four projects are needed in King County. In addition, a number of other projects, which are being implemented by Sound Transit, will also be required to fulfill the Amtrak *Cascades* service goals. These projects are located throughout the Puget Sound region and are discussed later in this chapter. **Exhibit 5-4** presents the general location of the King County Amtrak *Cascades* projects.

### Ballard Bridge Speed Increase (rail milepost 6.2 to 6.4)

The current speed on the bridge is twenty miles per hour. Increasing the Talgo speed limit to forty-five miles per hour and the freight speed limit to thirty-five miles per hour improves service and increases capacity and reliability. A final design solution for this problem has not been determined and will require an engineering evaluation of the bridge. The estimated construction cost of this project is $11.5 million.

### King Street Station Track Improvements (rail milepost 0.2 to 0.5)

WSDOT-sponsored Amtrak *Cascades*, Amtrak long-distance trains (*Coast Starlight* and *Empire Builder*), Sound Transit commuter trains, and BNSF freight trains all use the tracks at King Street Station. Currently, the tracks at the station will not accommodate the anticipated growth in rail traffic. New tracks and platforms at King Street Station will accommodate the planned increase in intercity, commuter, and freight trains. The estimated construction cost of this project is $92 million. This project is listed in the "2005 Transportation Partnership Account," but will require additional funding beyond the $15 million allocated by the state legislature.

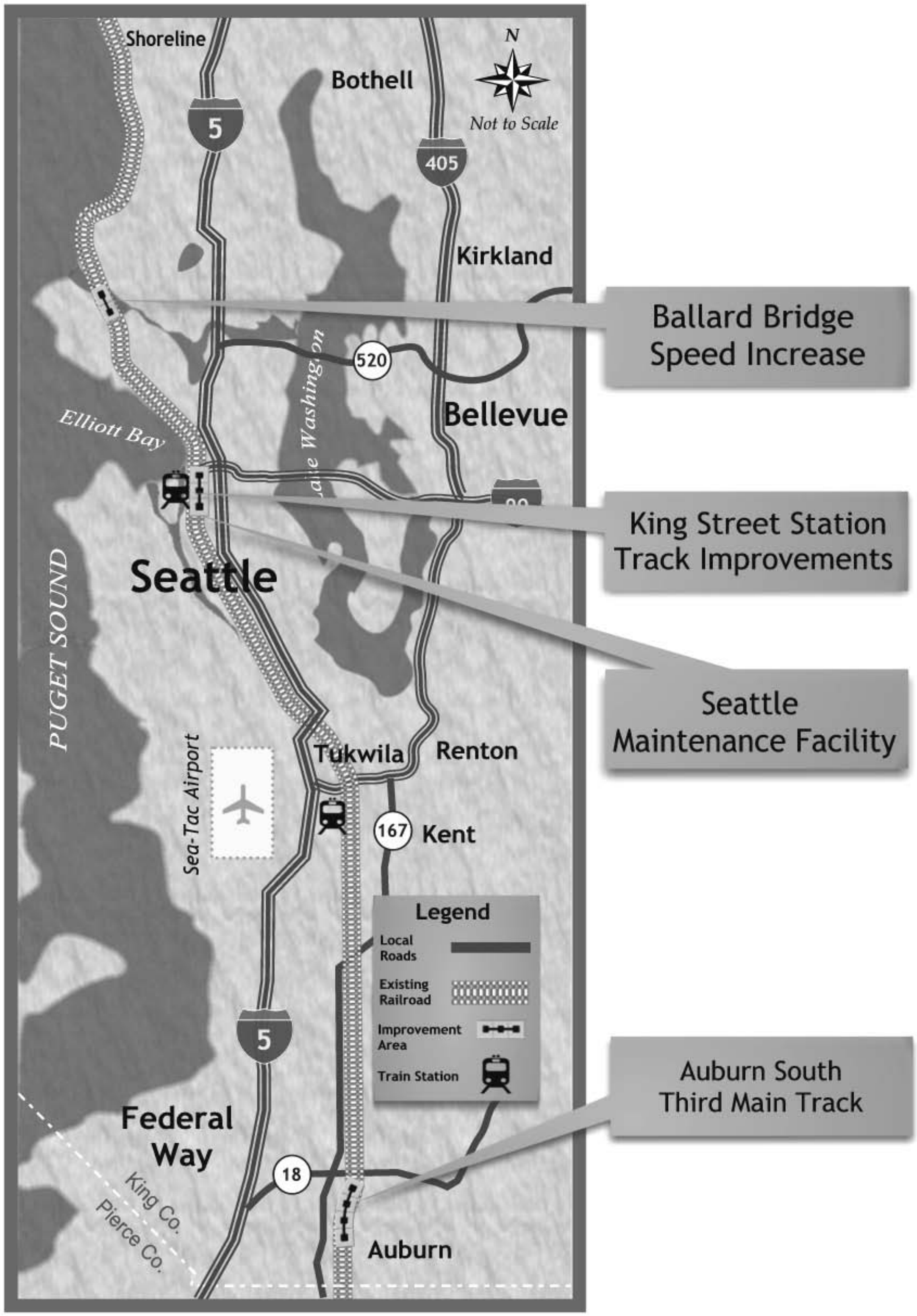
### Seattle Maintenance Facility

A new Amtrak maintenance facility is being constructed south of downtown Seattle, near Safeco Field. This facility will be the primary maintenance and repair site for current and future *Sounder* commuter trains, Amtrak *Cascades* trains, and Amtrak's long-distance *Empire Builder* and *Coast Starlight* trains.

The Seattle Maintenance Facility is being constructed in phases. The first phase, completed in 2002, includes a new rail car washer and a wheel maintenance building. The second phase, scheduled to begin in 2005 if funding is available, will include construction of the main service and inspection facility.

The entire facility is projected to cost $109 million, using funds from Amtrak, WSDOT, and Sound Transit.

**Exhibit 5-4**
**King County Project Improvements**



### Auburn South Third Main Track (rail milepost 20.9 to 24.2)

Sound Transit will construct a third main line track between Auburn and south of Kent. This configuration is useful for eliminating certain freight-passenger conflicts, but does not fully address passenger-passenger conflicts such as an Amtrak *Cascades* train overtaking a *Sounder* commuter train. Extending the third main track to the south end of Auburn Yard provides a configuration that allows movement from either track without slowing while the commuter trains are making the Auburn station stop. The estimated construction cost of this project is $23.9 million.

## What projects are needed in Pierce and Thurston Counties?

Eight projects have been identified for this part of the Pacific Northwest Rail Corridor. In addition, a number of other projects, which are being implemented by Sound Transit, will also be required to fulfill the Amtrak *Cascades* service goals. **Exhibit 5-5** presents the general location of these projects.

### Reservation to Stewart Third Main Track (rail milepost 38.2 to 33.9)

A new main line will be built next to the existing double track. The purpose of this track is to provide a dedicated track for lower speed freight trains that originate, terminate, or stop at Tacoma. The track is needed because freight traffic in this area is predicted to continue to grow over the next twenty years. Additional traffic without increased capacity will result in increased congestion and reduced reliability. The estimated construction cost of this project is $48.3 million**.**

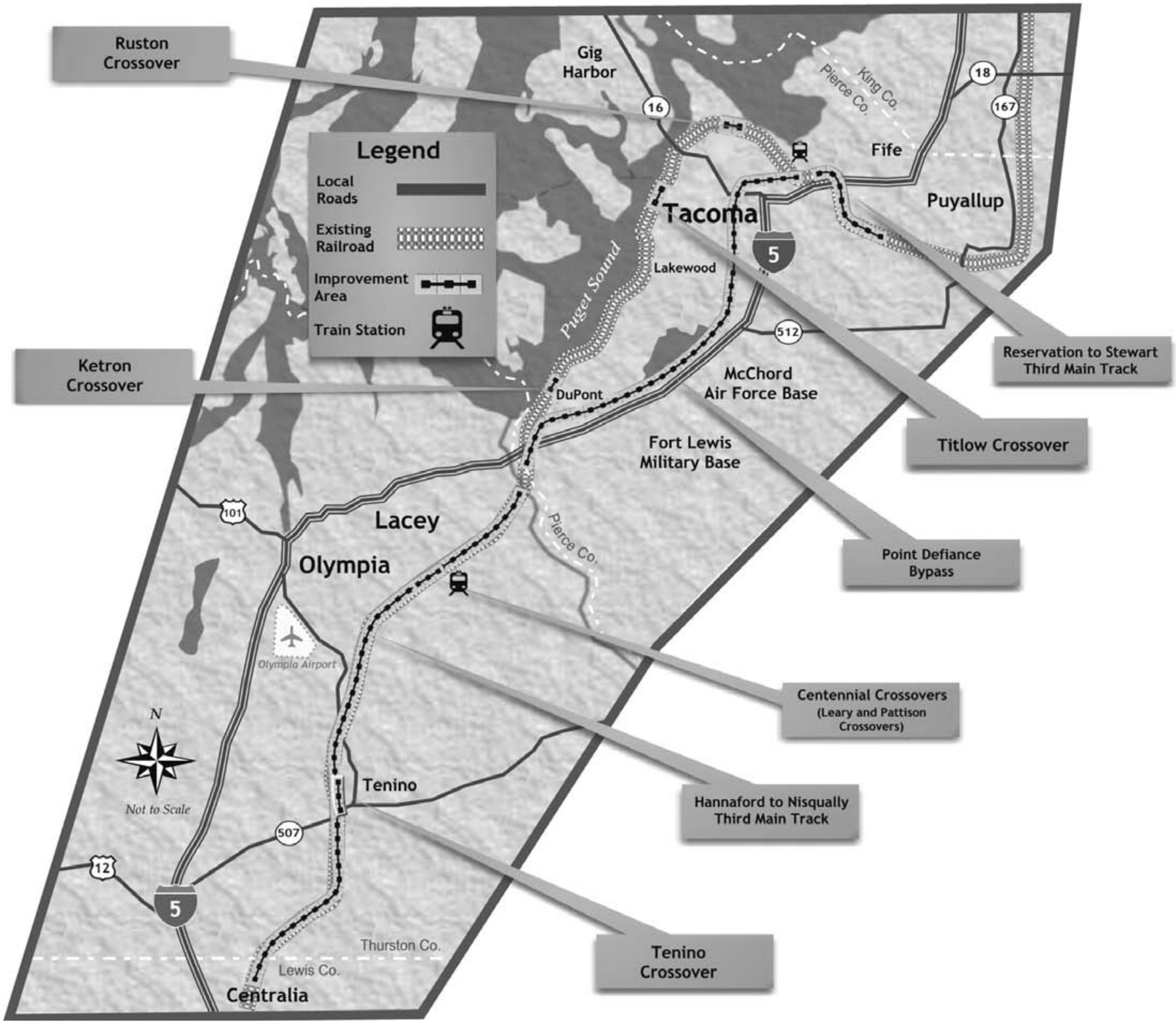
### Ruston Crossover (rail milepost 32)

Construction of this crossover provides flexibility for trains to move between tracks. This project provides increased reliability and capacity. This project was recently completed at a cost of $3.6 million.

### Titlow Crossover (rail milepost 10.2)

Construction of this crossover provides flexibility for trains to move between tracks. This project provides increased reliability and capacity. This project was recently completed at a cost of $4.0 million.

**Exhibit 5-5**
**Pierce and Thurston Counties Project Improvements**



### Point Defiance Bypass (rail milepost 25.38 to 12.71)

Currently passenger trains must slow down to use the curved tracks along Puget Sound and the single-track tunnels under Point Defiance. This project will build a bypass so that passenger trains can avoid those areas. Freight trains will continue to use the existing tracks in the Point Defiance area. This will provide reliable Amtrak *Cascades* service by reducing travel time by fourteen minutes and eliminate conflicts with freight trains.

The proposed route of this WSDOT project is the same that Sound Transit will use to extend *Sounder* Commuter Rail service to Lakewood. After both projects are completed, Amtrak trains and *Sounder* Commuter Rail will share the route with freight trains serving Fort Lewis.

The first part of this project will include a new second track between Tacoma and Lakewood. The second part of this project – for which funding is unavailable at this time – will include rehabilitation of tracks and speed increases between Lakewood and Nisqually. The current conceptual cost estimate for the entire project is $412 million. This project is listed in the "2003 Legislative Transportation Package" and the 2005 Transportation Partnership Account," but will require additional funding beyond the $59.8 million allocated by the state legislature.

### Ketron Crossover (rail milepost 18.4)

Construction of this crossover provides flexibility for trains to move between tracks. This project will provide increased reliability and capacity. The estimated construction cost of this project is $3.4 million. This project is listed in the "2003 Legislative Transportation Package," and is funded for up to $3.9 million.

### Centennial Crossovers (Leary and Pattison) (rail milepost 31.8 to 32.5)

Construction of these crossovers provides flexibility for trains to move between tracks when entering Centennial Station to ensure that passengers can exit the train on the east side of the rail line, adjacent to the station. Without these crossovers, there would be situations when a train would be on the west main line and would require passengers to cross the east main line. This project will provide increased capacity, reliability, and safety. The estimated construction cost of this project is $3.4 million. This project is listed in the "2003 Legislative Transportation Package," and is funded for up to $3.9 million.

### Hannaford to Nisqually Third Main Track (rail milepost 51.39 to 24.5)

A new twenty-six mile-long main line will be built next to the existing double track between Nisqually and the Lewis/Thurston county border, and a second new main line track will be built between rail milepost 36.2 and rail milepost

51. The purpose of these tracks is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Portland, OR to achieve WSDOT's service goal. This project is needed because the current physical condition of the track and the current track geometry in this location (due to the terrain) do not allow trains to travel at high speeds. The second high-speed track allows two Amtrak *Cascades* trains moving in opposite directions to pass without slowing. The estimated construction cost of this project is $512.5 million.

#### Tenino Crossover (rail milepost 43.3)

Construction of this crossover provides flexibility for trains to move between tracks. This project will provide increased reliability and capacity. The estimated construction cost of this project is $3.4 million. This project is listed in the "2003 Legislative Transportation Package," and is funded for up to $3.9 million.

### What projects are needed in Lewis, Cowlitz, and Clark Counties?

Fourteen projects have been identified for this part of the Pacific Northwest Rail Corridor. **Exhibit 5-6** presents the general location of these projects.

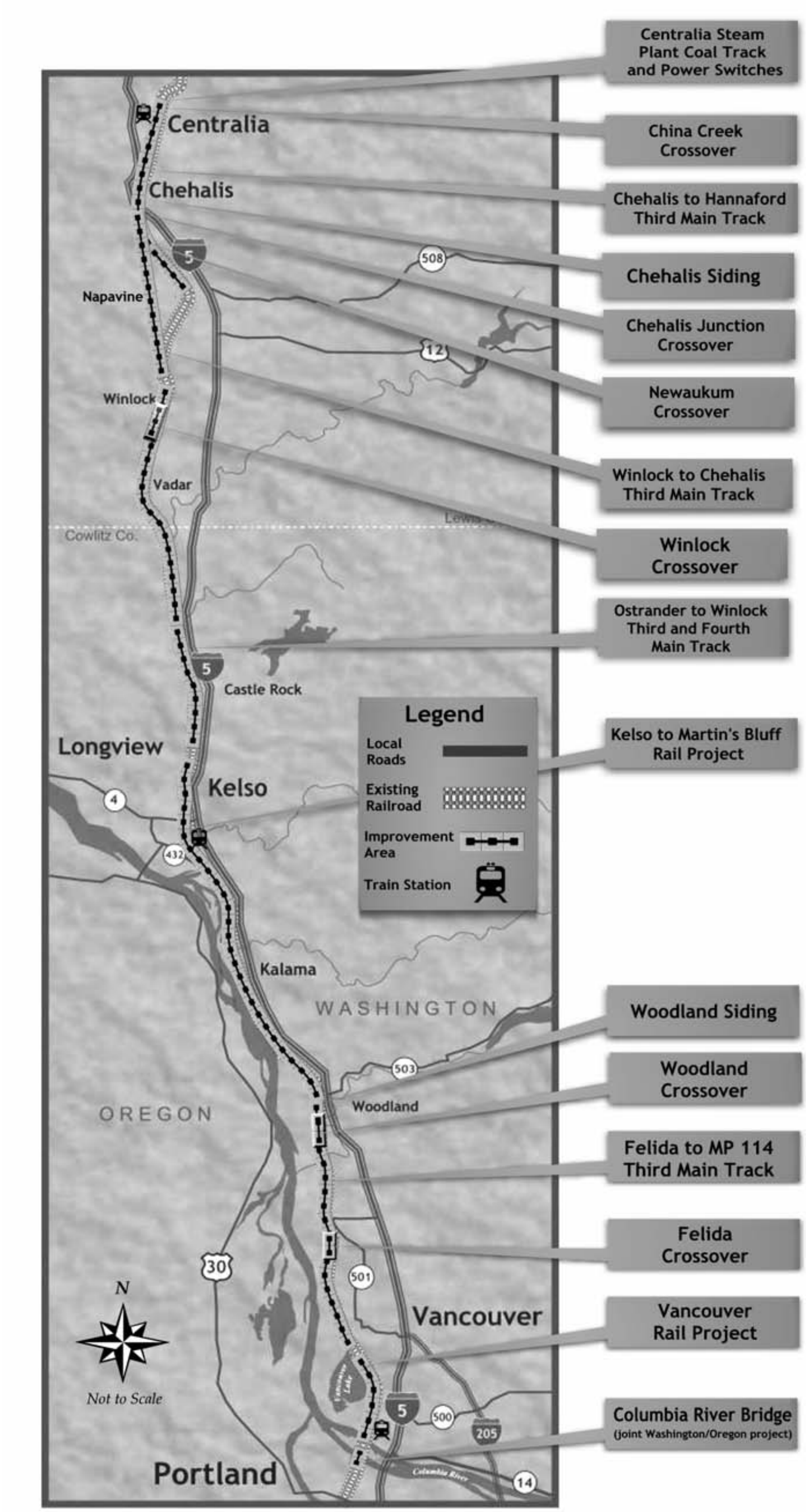
#### Centralia Steam Plant Coal Track and Power Switches (on a spur line near rail milepost 51.5)

Coal trains for the Centralia steam power generating station currently block the main line in this area. This project would improve the rail tracks off the main line to allow coal trains to enter and leave the main tracks at a higher speed, increasing capacity and improving reliability. The estimated construction cost of this project is $6.1 million.

#### China Creek Crossover (rail milepost 53.5 to 53.6)

Construction of this crossover provides flexibility for trains to move between tracks when entering Centralia's Union Depot, which ensures that passengers can exit the train on the west side of the rail line, adjacent to the station. Without this crossover, there would be situations when a train would be on the east main line and would require passengers to cross the west main line. This project will provide increased capacity, reliability and safety. The estimated construction cost of this project is $1.7 million.

**Exhibit 5-6**
**Lewis, Cowlitz, and Clark Counties Project Improvements**



### Chehalis to Hannaford Third Main Track (rail milepost 59.49 to 51.39)

A new main line will be built next to the existing double track. This track will provide sufficient capacity for reliable passenger train operation. The portion of the track between rail milepost 54.5 and rail milepost 58.2 will have ninety miles per hour speed limit, providing part of the travel time reduction needed between Seattle and Portland, OR to achieve WSDOT's service goal. The remainder of the track will be shared with freight traffic. The shared portion of the track is needed because freight traffic in this area is predicted to continue to grow over the next twenty years, requiring increased ability of passenger trains to overtake freight trains. Additional traffic will exceed the existing capacity, resulting in increased congestion and delay, and diminished reliability. With the addition of a dedicated main line, passenger trains can go faster, thereby increasing speeds and decreasing travel times.

The project will also construct a second platform at Centralia's Union Depot, giving passenger trains a choice of two tracks. This will reduce the conflict between passenger trains and freight trains that, depending upon their origin or destination and traffic conditions, may be unable to be routed to avoid a single passenger platform. The estimated construction cost of this project is $66.6 million.

### Chehalis Siding (rail milepost 56.8 to 58.3)

Currently, industrial tracks are connected directly to the main line. This area often gets congested because industry trains are using the main lines for switching and idling. Construction of a new siding off the main line would allow freight trains to wait and switch on the siding, thus freeing up the main line. This project would increase capacity and reliability. The estimated construction cost of this project is $11.3 million**.**

### Chehalis Junction Crossover (rail milepost 58.5 to 58.8)

Currently passenger trains can be delayed as long as fifteen minutes while they wait for freight trains to pass in this area. A crossover is a set of turnouts connecting multiple tracks. They allow trains to move from one track to another. The new set of crossovers in Chehalis will allow faster Amtrak *Cascades* trains to move around slower freight trains, at speeds up to 50 mph. Typical main line crossovers limit speeds to 35 mph or less. This project will provide improved Amtrak *Cascades* on-time performance and faster, more frequent Amtrak *Cascades* service. The estimated construction cost of this project is $3.5 million. This project is listed in the "2005 Transportation Partnership Account," at a funding level of $3.9 million.

### Newaukum Crossover (rail milepost 60.6 to 60.8)

Construction of this crossover provides flexibility for trains to move between tracks. This project will provide increased reliability and capacity. The estimated construction cost of this project is $3.4 million. This project is listed in the “2005 Transportation Partnership Account,” with a funding level of $3.5 million.

### Winlock to Chehalis Third Main Track (rail milepost 72 to 59.49)

A new main line and associated facilities will be in the vicinity of, but not entirely adjacent to, the existing double track. Because of the terrain and relatively sharp curves in this area, the existing alignment cannot accommodate the geometry necessary for high-speed tracks. The purpose of this project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Portland, OR to achieve WSDOT’s service goal. This project is needed because the current physical condition of the track and the current track geometry in this location do not allow trains to travel at high speed. The estimated construction cost of this project is $149.9 million.

### Winlock Crossover (rail milepost 71.8 to 72.1)

Construction of this crossover provides flexibility for trains to move between tracks. This project will provide increased reliability and capacity. The estimated construction cost of this project is $3.4 million. This project is listed in the “2003 Legislative Transportation Package,” with a funding level of $3.925.

### Ostrander to Winlock Third and Fourth Main Track (rail milepost 95.03 to 72)

A new main line will be built generally adjacent to the existing double track. A second new main line track will be constructed between rail milepost 81.7 and rail milepost 93.7. Because of the terrain and relatively sharp curves in this area, part of the existing alignment cannot accommodate the geometry necessary for high speed tracks. The purpose of this project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Portland, OR. This project is needed because the current physical condition of the track and the current track geometry in this location (because of the terrain) do not allow trains to travel at high speed. The second high-speed track allows two Amtrak *Cascades* trains moving in opposite directions to pass without slowing. The estimated construction cost of this project is $283.1 million.

### Kelso to Martin’s Bluff Rail Project (rail milepost 96.3 to 113.9)

This project consists of adding a third main line track, three sidings, construction of two rail yards, and associated facilities. The third main line will separate passenger traffic from freight traffic, allowing an increase in the number of passenger trains. The sidings will allow through trains to pass freight trains stopped to make pick-ups and deliveries. The project is needed because of current congestion on the rail line in this location. Once this project is completed, service will be more reliable and faster. The estimated construction cost of this project is $469.3 million. This project is listed in the “2003 Legislative Transportation Package,” but will require additional funding beyond the $50 million allocated by the state legislature. Conceptual design and environmental documentation for this project began in 2001. It is anticipated that final design will begin by 2007.

### Woodland Siding (rail milepost 115.3 to 117.1)

Currently, industrial tracks are connected directly to the main line. This is often congested because industry trains are using the main track for switching and idling. Construction of a new siding would allow freight trains to wait and switch, thus freeing up the main line. This project would increase capacity and reliability. The estimated construction cost of this project is $15.3 million.

### Woodland Crossover (rail milepost 118.6 to 118.8)

Construction of this crossover provides increased capacity and reliability. This project was recently completed at a cost of $2.8 million.

### Felida to MP 114 Third Main Track (rail milepost 130.45 to 112.2)

A new eighteen mile-long main line will be built adjacent to the existing double track. The purpose of this project is to allow passenger trains to operate at 110 mph, providing part of the travel time reduction needed between Seattle and Portland, OR to achieve WSDOT's service goal. This project is needed because the current physical condition of the track and the current track geometry in this location (because of the terrain) do not allow trains to travel at high speed. The estimated construction cost of this project is $173.1 million.

### Felida Crossover (rail milepost 130.4 to 130.8)

Construction of this crossover provides increased capacity and reliability. This project was recently completed at a cost of $2.2 million.

### Vancouver Rail Project (rail milepost 10 to 132.5)

This project consists of a double-track bypass of the Vancouver rail yard, a siding extension, and associated turnouts from rail milepost 132.6 to rail mile post 136.5. The bypass will separate grain freight traffic from passenger traffic to allow for projected increased traffic in both. It will also relieve congestion for freight coming from eastern Washington. West 39th Street, which bisects the rail yard, will also be grade separated, thus providing a safer crossing for vehicles and pedestrians. The estimated construction cost of this project is $86.6 million. This project is listed in the "2003 Legislative Transportation Package" but will require additional funding beyond the $51 million allocated by the state legislature. Conceptual design and environmental documentation for this project has been completed.

### Columbia River Bridge (rail milepost 9.61 to 10.14)

The Portland-Spokane route junction at the north end of the Columbia River Bridge has a 10 mph speed restriction. The junction connecting to the Port of

Portland at the south end of the Oregon Slough Bridge has a 10 mph speed restriction. The combination of these restrictions greatly reduces the capacity of the two main line tracks. Both junctions are constrained by urban development and cannot be modified to allow higher speeds. Capacity is further limited by the extended time of bridge openings caused by the relatively narrow navigation channel, the need to maneuver through an offset in the navigation channel between the adjacent Interstate 5 Bridge and the railroad bridge, and the slow operation of the swing-type railroad drawbridge. Construction of an additional bridge (next to the existing bridge) and modification of the existing bridge would provide better movement of traffic and reduce the effect of bridge openings on rail traffic. Capacity and reliability would increase. The estimated construction cost of this project is $575 million. It is anticipated that funds for this project will be shared between the states of Washington and Oregon, as well as other funding partners.

### Are any other improvements needed throughout the entire corridor?

In addition to these capital projects, an advanced signal system, allowing passenger rail speeds over seventy-nine miles per hour, will be required throughout the corridor. The new signal system will meet Federal Railroad Administration (FRA) requirements for high speed passenger trains and will ensure continued safe operation of Amtrak *Cascades* trains as speeds are incrementally increased. WSDOT’s plan for Amtrak *Cascades* service development will require that this system be in place between Seattle and Portland, OR for Timetable D. Such a system would also be needed between Seattle and Vancouver, BC by 2023. The current cost estimate for the advanced signal system throughout the corridor is $536 million.

In addition, funding has been provided for other systemwide improvements along the corridor. These projects are:

#### King Street Station Interim Improvements

Amtrak and the Washington State Department of Transportation (WSDOT) are working in partnership with the BNSF Railway Company to transform the busy and historic King Street Station.

The station is currently served by WSDOT-sponsored Amtrak *Cascades* trains. Amtrak long-haul trains (*Coast Starlight* and *Empire Builder*), and Sounder commuter trains. The current station facilities are run down and inadequate. Increases in service will only compound demands on King Street Station.

In addition to new restrooms and exposure of the station’s original architecture, the renovation will include a bigger lobby and waiting area.

Other improvements include improved ticketing and baggage facilities, new train arrival and departure displays, new way-finding signage to the surrounding neighborhoods, a new roof, exterior cleaning and safety and security improvements.

### King Street Station Transportation Center

The purpose of this project is to design and construct a multi-modal transportation center which will link the variety of public transportation services that are present in the vicinity of King Street Station. The center will link Amtrak *Cascades*, *Sounder* commuter rail, regional and local bus transit, light rail, and the Seattle streetcar. Seattle's intercity bus terminal will also be relocated to this transportation center. The initial focus this project will include conceptual design and preparation of an implementation strategy for project development.

### Cascades Trainset Overhaul

The three state-owned trainsets have been in service since 1999. They will be restored to like-new condition and their service life extended to approximately 2029. All three trainsets will receive interior and exterior improvements, including paint, seating, tables, carpet, toilets, windows, wall coverings, and video and audio systems.

In addition to this overhaul, trainsets will continue to be maintained and repaired on a regular basis. The state of Washington does not have any spare train cars, so maintenance and overhaul is critical to the continued service of the Amtrak *Cascades.*

### PNWRC Safety Improvements

Since the early 1990s, the U.S. federal government has provided grants to states with federally recognized high-speed rail corridors, which includes the Pacific Northwest Rail Corridor. This federal designation allows WSDOT to apply for federal grants to eliminate safety hazards where vehicles, pedestrians, and higher-speed passenger trains converge. Over the past ten years, WSDOT has received over $3 million for a variety of small rail safety projects between Blaine and Vancouver (WA).

## How will WSDOT and the BNSF work together to construct these infrastructure improvements?

In 2003, WSDOT and the BNSF entered into a *Master Corridor Development Agreement* that will govern the construction of Amtrak *Cascades* capital projects within Washington State. This agreement is an important milestone for WSDOT's Amtrak *Cascades* program, as it sets in place the legal framework and guiding principles that both WSDOT and the BNSF will abide by as WSDOT continues to provide public funding for intercity passenger rail corridor development. Some of the key highlights of the *Master Corridor Development Agreement* include:

- The expressed intent of both WSDOT and the BNSF to work together to develop Amtrak *Cascades* intercity passenger rail service between Portland, OR, Seattle, and Vancouver, BC over the next twenty years.
- BNSF's acceptance of WSDOT's detailed capital and operating plans for Amtrak *Cascades* service improvements within the rail corridor.
- A streamlined administrative process for executing the individual construction projects funded by WSDOT.
- Clearly defined expectations of the specific benefits that WSDOT will derive from each construction project in Washington State, including additional daily frequencies and reduced running times between cities. These clearly defined expectations will guarantee that the state of Washington will get what it is paying for.
- A method for apportioning cost for the various construction projects that provide direct benefits to both WSDOT and the BNSF.

This new *Master Corridor Agreement* between WSDOT and the BNSF is the first of its kind between a state government and a host railroad that sets a legally binding foundation for future development of state-funded intercity passenger rail service. It is expected that this new agreement will make it much easier for both WSDOT and the BNSF to complete the Amtrak *Cascades* capital projects within the state of Washington as identified in this plan.

## What projects will be undertaken by other agencies?

As part of WSDOT's ongoing relationship with Sound Transit, the province of British Columbia, and the state of Oregon, a number of projects that will benefit Amtrak *Cascades* service need to be implemented by these entities over the next twenty years. Without implementation of these projects, the build-out of the passenger rail program will not be achieved.

These projects are listed in **Exhibit 5-7** by jurisdiction/agency. More information about these projects can be found in the *Amtrak Cascades Operating and Infrastructure Plan Technical Report*, 2004. The general locations of the Oregon and British Columbia projects are illustrated in **Exhibits 5-8** and **5-9**. The Sound Transit projects are located between Lakewood and Seattle, as well as between Seattle and Everett.

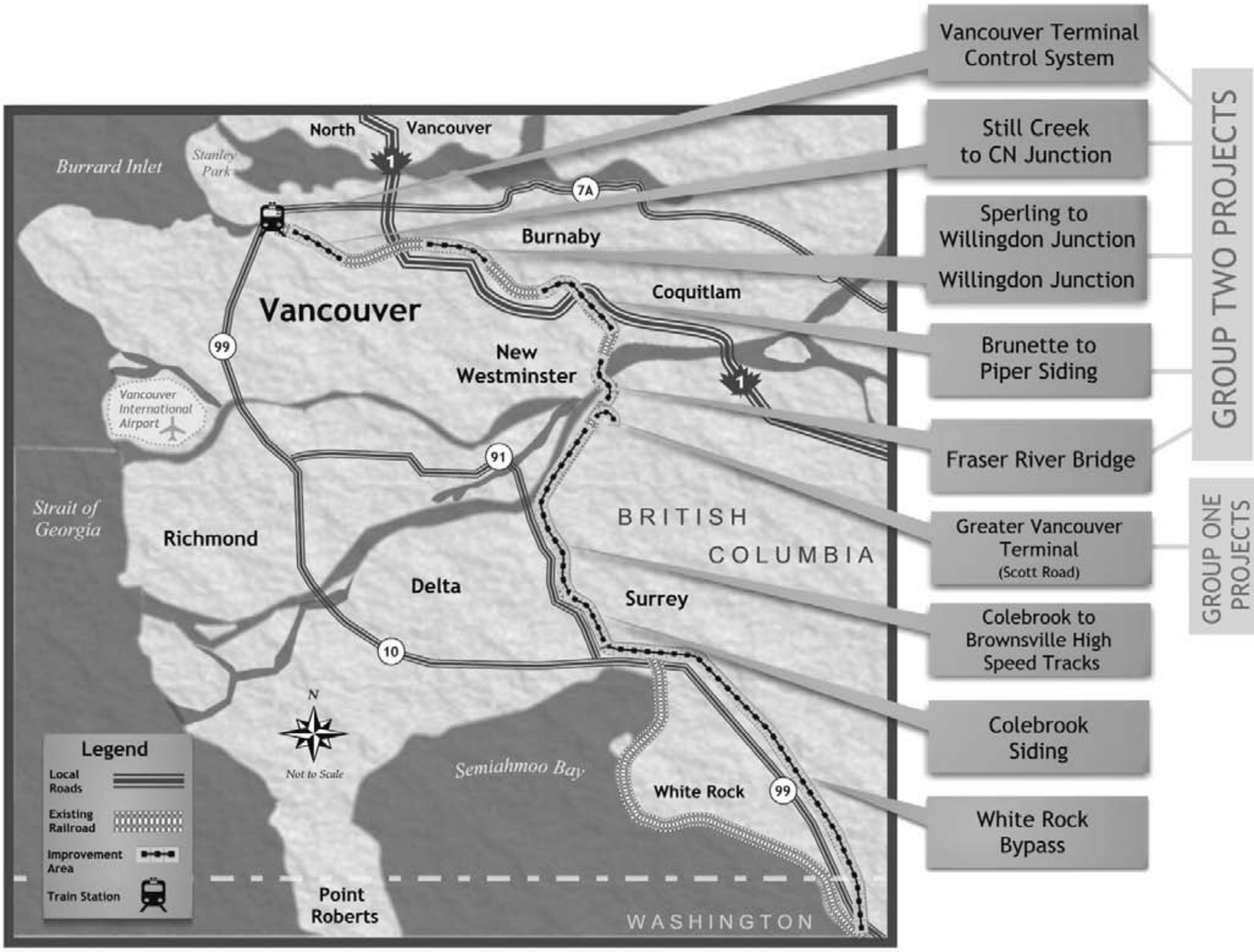
**Exhibit 5-7**
**Projects to be Implemented by other Agencies and Organizations**

| Jurisdiction/Agency | General Location | Project/Estimated Cost |
|---|---|---|
| | [1]Greater Vancouver Terminal (Scott Road Station) | Construct new passenger rail station/$86.3 million |
| British Columbia | [2]Vancouver Terminal Control System | Installation of new traffic control system/$6.9 million |
| | [2]Still Creek to CN Junction | New siding/$12.9 million |
| | [2]Sperling-Willingdon Junction Siding | New siding/$11.4 million |
| | [2]Willingdon Junction | Grade separation/$16 million |
| | [2]Brunette-Piper Siding | New siding/$28.6 million |
| | [2]Fraser River Bridge | Replace or improve existing bridge/$575 million |
| | Colebrook to Brownsville High-Speed Tracks (north of White Rock) | High speed track, continuation of White Rock bypass/$91.8 million |
| | Colebrook Siding | New siding/$11.4 million |
| | White Rock Bypass | High speed rail bypass/$312.7 million |
| | | |
| Sound Transit | Seattle to Everett | Various capacity improvements/$207 million |
| | Seattle to Tacoma to Lakewood | Installation of Centralized Traffic Control (CTC) system and additional trackage/$304 million |
| | Argo to Black River (south Seattle) | Reconfiguration of existing yard and main line tracks/Costs included above |
| | | |
| Oregon | Columbia River Bridge (joint Washington and Oregon project) | New bridge/$575 million. It is anticipated that funds for this project will be shared between the states of Washington and Oregon, as well as other funding partners. |
| | North Portland Junction to Kenton (north of Portland's Union Station) | Reconfiguration of existing tracks and new second main line/$58.7 million |
| | East St. Johns Siding and Main Track Relocation | Construction of a new siding and change in configuration of yard tracks/$40.4 million |
| | Lake Yard North Leads | Install high speed yard leads/$26 million |
| | Portland Union Station | Construct new turnouts and construct new main line/$7.6 million |

[1]*If Scott Road is chosen as the terminus for Amtrak Cascades service, then projects in Group [2] will not be required.* *Appendix E of this report discusses the possibility of terminating service at Scott Road in Vancouver, BC. WSDOT will work with regional, provincial, and Canadian federal officials to identify the potential benefits and losses that could result from such a change in service.*

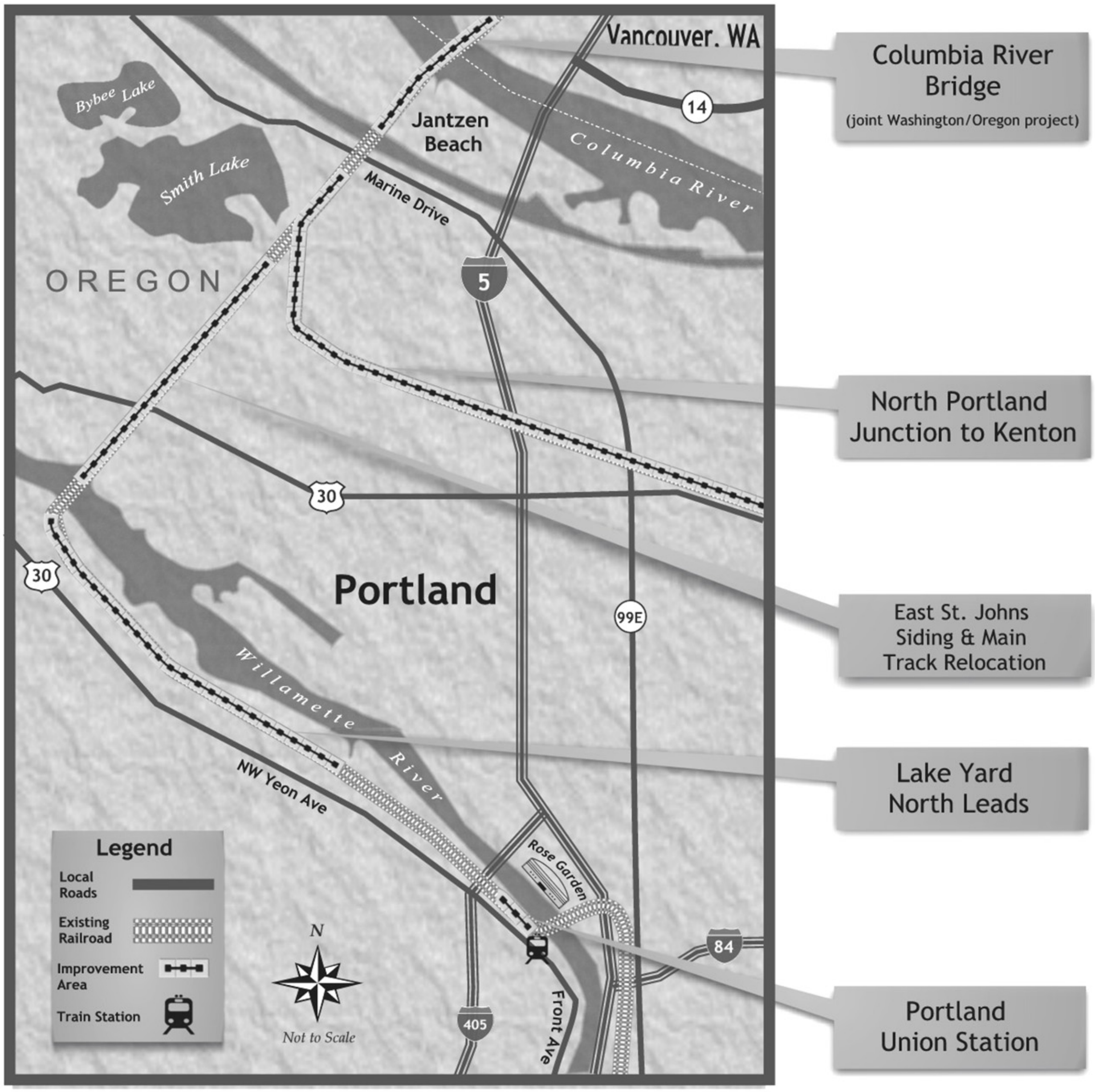
*Note: Canadian projects are estimated in 2006 U.S. dollars.*

**Exhibit 5-8**
**Vancouver, BC Project Improvements**




*Note: Either Group 1 or Group 2 projects would be required, but not both. If it is determined that Scott Road will be the terminus for Amtrak Cascades service in British Columbia, then only Group 1 projects would be required. If it is determined that Amtrak Cascades service will terminate at Pacific Station, then Group 2 projects would be required.*

**Exhibit 5-9**
**Portland, OR Project Improvements**



## When will these projects be built and how will they affect Amtrak *Cascades* service?

As discussed earlier in this chapter, each project improvement was designed to independently solve an operational problem along the Amtrak *Cascades* service corridor. In addition to their ability to solve the specific problems identified, coupled together, incremental service goals could also be achieved—specifically, additional daily round trips along the corridor. **Exhibits 5-10** and **5-11** present the Amtrak *Cascades* service goals that were discussed in Chapter Three of this document. Ordering projects in this manner ensures that each project has immediate utility regardless of future service improvements.

**Exhibit 5-10**
**Amtrak *Cascades* Daily Roundtrip Trains**

| Total Trains | 1994 | 2003 | Mid-point | 2023 |
|---|---|---|---|---|
| Portland, OR to Seattle, WA | 1 | 3 | 8 | 13* |
| Seattle, WA to Vancouver, BC | 0 | 2** | 3 | 4 |

**Includes three trains traveling north, beyond Seattle, to Vancouver, BC.*
***Amtrak Cascades #513/516 travels between Seattle and Bellingham.*

**Exhibit 5-11**
**Amtrak *Cascades* Travel Times**

| Destination | 1994 | 2003 | Mid-point | 2023 |
|---|---|---|---|---|
| Portland, OR to Seattle, WA | 3:55 | 3:30 | 3:00 | 2:30 |
| Seattle, WA to Vancouver, BC | N/A | 3:55* | 3:25 | 2:37 |
| Vancouver, BC to Seattle, WA to Portland, OR | N/A | N/A | 6:40 | 5:22 |

**Travel time for train #510/517.*

*Source for Exhibits 5-10 & 5-11: Amtrak Cascades Timetable Effective October 27, 2003, and Amtrak Cascades Operating and Infrastructure Plan Technical Report, 2004.*

### Building Blocks

Although each project independently solves a problem within the corridor, the projects must be constructed in the order identified in this plan. Service could not be increased as the projects are completed if projects are randomly built along the corridor, because the entire operating program was built on a series of building blocks to meet incremental service goals (timetables). **Exhibits 5-12** and **5-13** show the chronological relationship between the projects and service improvement. The completion year of these projects as well as the service provided is dependent upon funding and the length and complexity of the project's environmental process and permitting.

The order in which projects are built (and when) is based solely on the service timetables presented in this report. State and federal funding will dictate actual completion years—if funding becomes available sooner, service goals can be achieved sooner. If funding is not available, or targeted for a future date, then service goals will not be achieved within the identified twenty-year time frame.

In addition to funding, Amtrak *Cascades*' service goals are also dependent upon the completion of projects located outside of WSDOT's jurisdiction. As discussed earlier, responsible parties include Sound Transit, the state of Oregon, and the province of British Columbia. For those projects located outside of Washington State, WSDOT has only identified necessary improvements - Oregon and British Columbia have not yet researched, designed or funded these projects. Without implementation of these projects, Amtrak *Cascades* goals as presented in this report cannot be realized.

**Exhibit 5-12**
**Timetables and Relationship to Amtrak *Cascades* Service Goals**
**Seattle to Vancouver, BC**

| | | Service Goals | | |
|---|---|---|---|---|
| Seattle to Vancouver, BC<br>Project Improvement | Timetable (Completion Year) | Additional Daily Round Trip Trains | Total Daily Round Trip Trains | Schedule Running Time |
| Mount Vernon Siding | A | 1 | 2 | 3:55 |
| Swift Customs Facility<br>Stanwood Siding<br>PA Junction/Delta Junction Improvements<br>Bellingham GP Improvements<br>Colebrook Siding | B | 1 | 2 | 3:55 |
| Sound Transit: Seattle to Everett Improvements<br>Bow to Samish Siding Extension<br>Bellingham Siding Extension<br>Ballard Bridge Speed<br>Sperling to CN Junction<br>Vancouver, BC Project Improvements (see Exhibit 5-14 and accompanying text) | C<br>(Mid-point service) | 1 | 3 | 3:25 |
| Marysville to Mount Vernon High-Speed Track<br>Burlington to Bellingham High -Speed Track<br>Bellingham to Blaine High-Speed Track<br>Everett Junction to Everett Second Main Track<br>Advanced Signal System - 110 mph<br>White Rock Bypass<br>Colebrook to Brownsville High-Speed Track | F<br>(2023) | 1 | 4 | 2:37 |

*Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.*

**Exhibit 5-13**
**Timetables and Relationship to Amtrak *Cascades* Service Goals**
**Seattle to Portland, OR**

| Seattle to Portland, OR<br>Project Improvement | Timetable (Completion Year) | Service Goals: Additional Daily Round Trip Trains | Service Goals: Total Daily Round Trip Trains | Service Goals: Schedule Running Time |
|---|---|---|---|---|
| Felida Crossover<br>Woodland Crossover<br>Titlow Crossover<br>Ruston Crossover<br>Sound Transit: Seattle to Lakewood Improvements | A | 1 | 4 | 3:25 |
| Vancouver Rail Project<br>Kelso to Martin's Bluff Rail Project<br>Centennial Crossovers (Leary and Pattison)<br>Winlock Crossover<br>Tenino Crossover<br>Ketron Crossover<br>North Portland Junction to Kenton | B | 1 | 5 | 3:20 |
| Point Defiance Bypass<br>Reservation to Stewart Third Main Track<br>Centralia Steam Plant Coal Track and Power Switches<br>Woodland Siding<br>Newaukum Siding<br>King Street Station Track Improvements<br>China Creek Crossover<br>Auburn South Third Main Track<br>Seattle Maintenance Facility<br>Sound Transit: Seattle to Lakewood Improvements | C (Mid-point service) | 3 | 8 | 3:00 |
| Winlock to Chehalis Third Main Track<br>Chehalis Siding<br>Chehalis Junction Crossover<br>East St. Johns Siding and Main Track Relocation<br>Lake Yard North Leads<br>Portland Union Station<br>Advanced Signal System - 110 mph | D | 2 | 10 | 2:55 |
| Chehalis to Hannaford Third Main Track<br>Ostrander to Winlock Third and Fourth Main Track | E | 2 | 12 | 2:45 |
| Felida to MP 114 Third Main Track<br>Hannaford to Nisqually Third Main Track<br>Columbia River Bridge (Washington/Oregon project) | F (2023) | 1 | 13 | 2:30 |

*Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals*

Another critical decision outside of WSDOT's jurisdiction regards the terminus of the Amtrak *Cascades* service in Canada. Currently service terminates/begins at Vancouver's Pacific Central Station. However, in order to increase service to this facility, major infrastructure projects would be required.

### What would be required in order to continue service to Vancouver's Pacific Central Station?

Due to the topography, condition of the existing rail line, and the environmental constraints in British Columbia, it is going to be very difficult to meet the Amtrak *Cascades* service goals without implementing a number of project improvements. As presented in **Exhibit 5-14,** the estimated cost of constructing these improvements could be as high as $650 million.

**Exhibit 5-14**
**British Columbia Infrastructure Requirements Needed Before Mid-Point Service**

| Infrastructure Improvement | Estimated Cost |
|---|---|
| Alternative 1: Pacific Central Station Terminus | |
| Fraser River Bridge Improvement | $575 million |
| Brunette to Piper Siding | $28.6 million |
| Sperling to Willingdon Junction | $11.4 million |
| Still Creek to CN Junction | $12.9 million |
| Vancouver Control System | $6.9 million |
| Willingdon Junction | $16 million |
| Alternative 2: Scott Road Terminus | |
| Scott Road Station | $86.3 million |

*Source: Amtrak Cascades Capital Cost Estimates Technical Report, 2006*

### Is there another option for a Greater Vancouver, BC terminus?

WSDOT and other agencies along the Pacific Northwest Rail Corridor have studied the possibility of terminating service at Scott Road, which is located about ten miles south of Pacific Central Station. If service were terminated at this location, passengers would be able to travel to downtown Vancouver via the SkyTrain station at Scott Road. By terminating service at this station, infrastructure improvement costs could feasibly be reduced by $565 million.

As part of the ridership and financial analysis for this twenty-year plan, forecasts were developed for the Scott Road Station alternative. Findings indicate that ridership between Vancouver, BC and Seattle would increase by 7.3 percent (in year 2023) if Amtrak *Cascades* service were terminated at Scott Road. Results of these analyses can be found in **Appendix F** of this report.

### What key factors will influence the location of the Amtrak *Cascades'* northern terminus?

As indicated in **Exhibit 5-14**, a series of infrastructure improvements must be completed before a third round trip between Seattle and Vancouver, BC is possible. In this plan, it is assumed that these capital projects will be completed by Amtrak *Cascades* mid-point service, the most expensive of which is a new crossing of the Fraser River between Surrey and New Westminster. The New Westminster Rail Bridge, a swing-span structure constructed in 1904, is a major choke point for a number of freight and passenger rail operators in the greater Vancouver area. Canadian officials are currently studying bridge replacement options, but a funding plan for a new structure has not yet been developed. Unless and until this bridge is replaced or substantially upgraded, it will not be possible to add any more Amtrak *Cascades* service between Seattle and Pacific Central Station in Vancouver, BC beyond two daily round trips.

In 2010, Vancouver/Whistler, BC will be hosting the Winter Olympics. This major international event is expected to draw hundreds of thousands of visitors to the Vancouver, BC area. If Amtrak *Cascades* trains are to play a role as a transportation provider before, during, and after the 2010 Olympic Games, regional, provincial, and Canadian federal transportation officials will need to decide if funding the projects necessary for additional Amtrak *Cascades* service is a priority for the region, and if these projects will have a legacy of public benefits after the Olympic Games. These officials will also have to determine if the current station location is the best place for intercity rail travelers—when placed within the context of the region's multi-modal transportation plan developed for the 2010 Olympic Games and beyond.

The final key factor that will influence the location of the Amtrak *Cascades'* northern terminus in Vancouver, BC is customer preference. While a Scott Road Station could eliminate the need for major rail line improvements north of the Fraser River, Amtrak and WSDOT have only limited data to assess the commercial impacts of a northern terminus at Scott Road, rather than downtown Vancouver. BC. WSDOT, Amtrak, and Canadian officials will need to gather this customer data and include it in a full benefit/cost assessment before deciding if relocating the Amtrak *Cascades'* northern terminus from Pacific Central Station to Scott Road is the best course of action.

## Once funding becomes available, what are the first steps?

Once funding is available for capital projects in Washington State, WSDOT will work with the BNSF to discuss general design and operational considerations and requirements. Conceptual engineering will then begin. Following conceptual engineering, the preparation of environmental documentation will be required.

### What type of environmental documentation will be prepared?

Under the State Environmental Policy Act (SEPA), any agency that proposes to take an official action is required to perform a series of environmental analyses[7] to ensure minimal impacts will result from that action. At the federal level, pursuant to the National Environmental Policy Act (NEPA), a similar environmental analysis must be performed if the proposed action is being implemented by a federal agency, requires a federal permit, or has federal funding. As a result, each of the identified project improvements (which are being initiated by a state agency and potentially may have federal funding) must follow federal and state environmental regulations as dictated by SEPA and NEPA.

Under NEPA, the Federal Highway Administration (FHWA) and the Federal Railroad Administration (FRA) will act as federal co-lead agencies, while WSDOT will act as the lead SEPA agency. To satisfy both NEPA and SEPA requirements, the three agencies will identify the appropriate level of environmental documentation necessary for each project improvement. Prior to designing and constructing any of these projects, the appropriate environmental documentation will be prepared. Following completion of this documentation, final design, permitting, and mitigation planning will be developed. Only after these steps are completed would construction begin.

### What follows the environmental analysis?

Following preparation and approval of the environmental documentation, final engineering can begin. Once engineering is complete, permitting and construction can move forward.

[7] *Unless the action is exempt under SEPA.*